

CLIMATOLOGICAL DATA FOR FEBRUARY, 1912.

DISTRICT No. 11, CALIFORNIA.

Prof. ALEXANDER G. McADIE, District Editor.

GENERAL SUMMARY.

February, 1912, was a very dry month. While not the driest on record, it followed an extended period of drought and the absence of rain was therefore more serious than even a rainless month following a normal fall. Over a large portion of the State no rain fell and even in the northern counties it was light and poorly distributed. In a record covering 63 years at San Francisco there has been only 1 February, that of 1864, when no rain fell, while there have been 7 with totals less than that of February, 1912. In a record covering 63 years at San Diego, this was the only February without rain.

The month was warmer than usual, due chiefly to a succession of bright sunshiny days during the latter half of the month. This condition was most marked in the southern and central counties, while in the northern counties there was considerable morning cloudiness.

The month will long be remembered as a dry month, chiefly because there was widespread discussion and comment in the press regarding the probable scarcity of water during the coming summer months, as this is a State in which there is little rain during the summer and all activities are influenced by and dependent upon the stored water in the mountains in the form of snow, or, as it is sometimes called, "frozen storage." There was good ground for apprehension as the days went by and the snow cover, already abnormally small and restricted, decreased in depth and area. Near the close of the month there was less than one-sixth of the visible water supply of what is technically known as a good water year. For example, there was at Summit, Placer County, the culminating point of the 40 miles of snowsheds over the Sierra, only 23 inches of snow on the ground at the end of February. Referring to the snowfall data published further on, it will be seen that on the same date in 1907 there was 88 inches; in 1908, 74 inches; in 1909, 213 inches; 1910, 72 inches; 1911, 215 inches.

The effects of the light snowfall were shown in the use of auxiliary steam plants by the various hydro-electric power companies transmitting electrical energy from the mountain streams to cities in the valleys and on the coast. Fortunately the dry period was broken at the beginning of March, and while the prospective water supply is below that of a normal year, the general feeling of apprehension has been allayed.

The month was quite unlike February, 1911. There were no flood periods and no interruptions to traffic on account of heavy rains and washouts.

The month began with pressure distribution favorable for dry weather, light north winds, and high afternoon and low morning temperatures. A maximum temperature of 82° occurred at Los Angeles on February 1, with 74° at San Diego, and 68° at San Francisco. On February 6 a small depression developed over the north Pacific and

moving southeastward caused rain in California north of the Tehachapi. The rains, however, were light and there was general disappointment because the storm did not afford the much-needed and hoped-for rain in the counties south of the thirty-seventh parallel. A second disturbance appearing about February 13 likewise failed to give rain in the south and in the interior counties. During the rest of the month the weather was dry and warm. On February 19 the relative humidity at San Francisco was as low as 23 per cent, an unusual condition at that station. On February 23 brisk to high north or northwest winds prevailed throughout California. At Point Reyes Light a maximum wind velocity of 88 miles occurred, and attention is called to the note published further on in this report, showing a total wind movement at that place, aggregating 3,725 miles in a period of 3 days, somewhat under a mile a minute for 72 hours.

There were comparatively few frosts and none very heavy. Some damage was done to the almond blossoms, then in a tender condition, by the frosts of February 26, 27, and 28.

There was much less fog than usual and very little of the variety known as "tule" in the Great Valley. While the morning hours were cloudy, there was practically none of the usual dense low-lying fog in the river basins. The winds were mostly north, and there were very few southeast winds. The month was exceedingly pleasant for visitors and others having outdoor occupations, but unfavorable for stockmen, miners, engineers, and farmers.

TEMPERATURE.

The mean temperature for the State was 1.2° above the normal. The following table gives the mean temperature for California for each February during the time such records have been kept:

Year.	Mean.	Departure.	Year.	Mean.	Departure.
	°F.	°F.		°F.	°F.
1897.....	48.0	-0.5	1905.....	50.8	+2.3
1898.....	49.4	+.9	1906.....	52.0	+3.5
1899.....	48.5	0	1907.....	53.3	+4.8
1900.....	49.9	+1.4	1908.....	46.8	-.7
1901.....	47.7	-.8	1909.....	46.6	-.9
1902.....	50.3	+1.8	1910.....	46.0	-2.5
1903.....	43.7	-4.8	1911.....	43.7	-4.8
1904.....	54.5	+6.0	1912.....	49.7	+1.2

The highest temperature recorded was 92° on the 18th at Ojai Valley. This was 3° higher than the highest temperature recorded at any station during February, 1911. The lowest temperature was -10° at Tamarack on the 3d. This was 20° higher than the lowest temperature of February, 1911.

The highest mean temperature was 62.2° at Soledad and the lowest was 22.9 at Tamarack.

PRECIPITATION.

The average precipitation for California for February with departures from the normal is as follows:

Year.	Mean.	Departure.	Year.	Mean.	Departure.
	Inches.	Inches.		Inches.	Inches.
1897.....	5.85	+1.44	1905.....	4.24	-0.17
1899.....	2.95	-1.46	1906.....	4.88	+.47
1899.....	.45	-3.96	1907.....	4.14	-.27
1900.....	.94	-3.47	1908.....	3.99	-.42
1901.....	6.03	+1.62	1909.....	8.00	+3.59
1902.....	8.14	+3.73	1910.....	2.43	-1.98
1903.....	1.76	-2.65	1911.....	3.33	-1.08
1904.....	7.91	+3.50	1912.....	.75	-3.66

The greatest monthly precipitation was at Weitchpec, 18.16 inches, or nearly 5 inches more than the heaviest monthly amount reported during February, 1911. At 84 stations there was no rain during the month.

The rain was not well distributed geographically, and, as has been emphasized above, was light in amount and poorly distributed as to frequency.

SNOWFALL IN THE MOUNTAINS.

No snow fell during the latter half of the month, and there was only a light fall during the first half. At the close of the month the snow cover was less deep and less extensive than during any previous February of record. The run-off was light and all streams were unusually low. The water supply was inadequate, and at many places power companies had to resort to auxiliary plants. There was general apprehension of a scarcity of water during the spring and summer months; but fortunately the first week in March has been marked by generous and general rain.

SPECIAL COMPARATIVE REPORTS.

Summit.—The following table shows depth of snow on ground at Summit on several dates in February for a number of years:

	Feb. 1.	Feb. 14.	Feb. 28.
	Inches.	Inches.	Inches.
1907.....	137	95	88
1908.....	88	115	74
1909.....	172	224	213
1910.....	76	70	72
1911.....	228	240	215
1912.....	38	27	23

SUNSHINE.

The following table gives the total hours of sunshine and percentages of possible:

Stations.	Hours.	Per cent of possible.	Stations.	Hours.	Per cent of possible.
Eureka.....	89	29	Sacramento.....	186	60
Fresno.....	257	82	San Diego.....	246	77
Los Angeles.....	260	81	San Francisco.....	171	54
Mount Tamalpais.....	146	47	San Jose.....	211	67
Red Bluff.....	155	50	San Luis Obispo.....	215	68

There was more sunshine during the current February than during February last year.

NOTES ON THE RIVERS OF THE SACRAMENTO AND SAN JOAQUIN WATERSHEDS DURING FEBRUARY, 1912.

By N. R. TAYLOR, Local Forecaster.

The Sacramento watershed.—The dry period from the 13th to the close of the month resulted in a gradual diminution of the run-off of all streams in this watershed.

At no time was there sufficient rainfall to appreciably increase stream flow in any part of the Sacramento Valley.

At Red Bluff the Sacramento River averaged 3.4 feet, which equals the previous low-water record of February, 1900. At all other points streams were much lower than they have ever been before in the corresponding month. The following data from selected points in the Sacramento drainage basin show the normal stages and the departures from the normal: Red Bluff, on the Sacramento, normal for 13 years 8.7 feet, departure -5.3 feet; Colusa, on the Sacramento, normal for 6 years 16.3 feet, departure -7.7 feet; Sacramento City, on the Sacramento, normal for 13 years 19.5 feet, departure -9.7 feet; Folsom, on the American, normal for 6 years 5.7 feet, departure -2.7 feet; Oroville, on the Feather, normal for 6 years 5.9 feet, departure -3.4 feet; Marysville, on the Yuba, normal for 6 years 10.6 feet, departure -3.5 feet.

The San Joaquin watershed.—All streams in this watershed remained practically stationary at extreme low-water stages. In most cases they averaged from 0.1 to 0.5 of a foot below that of the preceding month. The rainfall, like that of the Sacramento watershed, was markedly deficient, and there was an unusual scarcity of snow throughout the mountains.

All streams in the drainage basin of the San Joaquin will probably be unusually low during the coming low-water season, especially in that part lying above the mouth of the Merced River; and it is quite unlikely that a sufficient amount of snow will accumulate in the mountains from now on to cause the usual June freshets.

WEATHER AT FRESNO, CAL., DURING FEBRUARY, 1912.

By Mr. W. E. BONNETT, Local Forecaster.

No rain in measurable amount fell during the month, and it was the driest February of the last 25 years, although several others have had very small amounts. The drought of the month is not so important in itself, but the cumulative effects of the prolonged dry season are beginning to show in many ways. Grain is beginning to turn yellow, the foothills are as parched and dry as they would be in August, and cattle and sheep men are buying feed for their herds and flocks. Plowing in the heavier soils is practically impossible, and general farm work is being interfered with. Owing to the prospect for a considerable shortage in irrigation water for the late summer, the new acreage planted to trees and vines will probably be somewhat smaller than in former years. Mature trees and vines in most places will not suffer from the lack of water, but those newly planted will need frequent irrigation, and a great many pumping plants are being installed in vineyards and orchards as a measure of safety. The total rainfall for the season at the end of February is 2.05 inches: No other season in the last 25 years has had so little.

NOTE ON THE WEATHER AT POINT REYES LIGHT, CAL., DURING FEBRUARY, 1912.

By Mr. JAS. JONES, Observer.

On the 20th a northwest gale began, which continued until the 24th. The maximum velocity of 88 miles per hour attained on the 23d was the highest velocity from the northwest ever recorded here during the winter season and the highest from any direction for the month of February since 1902. The total wind movement for the three days, 21st, 22d, and 23d, was 3,725 miles, an average of 51.7 miles per hour for the 72 consecutive hours.

TABLE 1.—Climatological data for February, 1912. District No. 11—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years	Temperature, in degrees Fahrenheit.						Precipitation, in inches.						Sky.	Observers.		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, un.netted.	Number of rainy days, 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.	
<i>California—Continued.</i>																			
Shasta.....	Shasta.....	1,048	16	44.8	- 3.4	75	27	23	24	45	4.14	- 5.93	1.24	0	8	20	5	4	nw.
Sierra Madre.....	Los Angeles.....	1,400	15	58.4	+ 4.0	88	17	40	11†	36	T.	- 4.77	T.	0	0	20	6	3	n.
Sierraville.....	Sierra.....	5,000	2	31.6	.....	60	29	2	25	48	0.00	.....	0.00	0	8	11	10	sw.	
Sissoo.....	Siskiyou.....	3,555	23	39.7	+ 2.8	65	6	16	25†	32	1.62	- 4.38	0.52	0.2	11	9	6	14	s.
Soledad **.....	Monterey.....	188	38	62.2	+ 12.0	85	15	48	1	.....	0.00	- 1.58	0.00	0	0	24	0	5	n.
Sonora.....	Tuolumne.....	1,825	24	48.2	.....	67	29	26	23	33	0.00	- 6.12	0.00	0	0	20	8	1	w.
Southeast Farallon.....	San Francisco.....	30	9	52.0	.....	59	1	42	2	12	0.52	.....	0.27	0	6	9	9	11	nw.
Springville.....	Springville.....	4,000	5	45.0	.....	78	6	20	24†	35	0.70	.....	0.40	2.0	3	24	0	5	.....
Squirrel Inn.....	San Bernardino.....	5,280	2	44.1	.....	61	17	21	24	23	T.	.....	T.	0	0	26	2	1	n.
Stanwood.....	Butte.....	2,140	3	45.2	.....	62	28	28	22	36	1.59	.....	0.82	0	5	12	6	11	se.
Stirling City.....	do.....	3,525	8	44.8	.....	68	29	28	23	34	1.10	.....	0.70	0	3	13	14	2	se.
Stockton (S. H.).....	San Joaquin.....	23	41	52.2	+ 2.2	70	29	30	25	32	0.16	- 2.19	0.10	0	2	19	10	0	nw.
Storey.....	Madera.....	296	12	47.7	- 0.9	69	28	22	25	40	0.00	- 1.69	0.00	0	0	24	5	5	nw.
Suisun **.....	Solano.....	20	32	48.9	- 2.6	59	11	38	7	.....	0.37	- 2.97	0.15	0	3	25	0	4	sw.
Sulphur Banks.....	Lake.....	1,350	2	48.9	.....	69	1	34	4†	34	0.34	.....	0.26	0	2	14	12	3	w.
Summerdale.....	Mariposa.....	5,270	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tummit.....	Placer.....	7,017	39	33.2	+ 4.4	52	5	12	24	46	0.46	- 7.45	0.13	3.0	4	14	0	15	sw.
Susanville.....	Lassen.....	4,175	23	37.7	+ 3.5	58	29	11	25	31	0.10	- 2.98	0.06	0	2	13	15	1	sw.
Samarack.....	Alpine.....	8,000	6	22.9	.....	50	5	- 10	3	52	0.50	.....	0.15	6.0	4	8	12	9	sw.
Tehachapi **.....	Kern.....	3,964	35	42.5	+ 3.2	61	4	22	25	.....	0.00	- 2.59	0.00	0	0	0	0	0	.....
Tehama.....	Tehama.....	220	41	53.8	+ 2.8	78	28	34	24	55	0.26	- 2.49	0.26	0	1	26	0	3	n.
Tejon Rancho.....	Kern.....	1,500	10	46.2	.....	69	29	28	24	30	0.20	.....	0.09	0	3	23	6	n.	
Three Rivers.....	Tulare.....	870	2	51.4	.....	79	29	26	24†	42	0.04	.....	0.04	0	1	13	12	4	sw.
Towle.....	Placer.....	3,704	26	41.3	- 0.7	68	28	20	25	35	0.57	- 10.23	0.23	0	4	20	1	8	w.
Tracy.....	San Joaquin.....	64	32	53.8	+ 3.3	66	28	38	3	.....	0.40	- 1.05	0.30	0	2	12	13	4	nw.
Ukiah.....	Mendocino.....	620	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Upper Lake.....	Lake.....	1,350	27	49.0	+ 2.0	76	2	23	24	48	1.07	- 3.41	0.41	0	7	12	8	9	nw.
Vacaville.....	Solano.....	175	24	53.5	+ 2.5	77	28	27	26	42	0.31	- 3.83	0.12	0	4	10	18	1	sw.
Valley Springs **.....	Calaveras.....	673	23	53.0	+ 1.8	69	28	40	1†	.....	0.03	- 3.65	0.03	0	1	13	14	2	nw.
Visalia.....	Tulare.....	334	24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warner Springs.....	San Diego.....	3,165	4	52.0	.....	83	19	21	24	50	T.	.....	T.	0	0	24	3	2	c.
Wasco.....	Kern.....	336	12	49.6	0.0	75	29	27	25	44	0.00	- 1.30	0.00	0	0	4	5	20	.....
Watsonville.....	Santa Cruz.....	23	16	48.8	- 3.1	75	4	23	27	45	0.47	- 3.44	0.32	0	2	14	10	5	sw.
Weaverville.....	Trinity.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Welchespec.....	Humboldt.....	1,700	2	45.2	.....	63	28	26	24	29	18.16	.....	5.57	0	16	13	4	12	n.
Westley **.....	Stanislaus.....	90	23	50.7	+ 7.8	72	19	35	1†	.....	0.14	- 1.38	0.05	0	3	21	3	5	n.
Wheatland.....	Yuba.....	84	25	50.9	+ 2.0	68	29	33	25†	31	0.72	- 2.74	0.47	0	4	10	11	8	n.
Willows.....	Glenn.....	136	33	53.0	+ 4.2	78	16	28	26	37	0.26	- 2.23	0.18	0	3	15	8	6	n.
Yosemite.....	Mariposa.....	3,945	8	41.6	.....	70	29	16	25†	48	0.18	.....	0.18	0	1	16	10	3	s.

*, †, ‡, etc., indicate respectively 1, 2, 3, etc., days missing from the record.

** Temperature extremes are from observed readings of the dry bulb; means are computed from observed readings.

† Also on other dates.

T. Precipitation is less than 0.01 inch rain or melted snow.

TABLE 2.—*Daily precipitation for February, 1912. District No. 11—Continued.*

Stations.	Watershed.	Day of month.																												Total.		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
<i>California—Continued.</i>																																
Towle.....	Sacramento.....								.08	.08								.18														0.57
Tracy.....	San Joaquin.....							.10										.30														0.40
Tulare.....	do.....																		.08													0.08
Tustin (near).....	Coast.....																														0.00	
Ukiah.....	do.....																															
Upland.....	do.....																															
Upper Lake.....	Sacramento.....							T.	.41	.07	T.							.21	.20												1.07	
Upper Mattole.....	Coast.....							.45	.12		.87	.64	.32	.80	.53			.80	.42	.03	.99	1.45	.75									8.11
Vacaville.....	Sacramento.....							.10	.03									.12	.06											0.31		
Valley Springs.....	San Joaquin.....								.08																						0.03	
Visalia.....	do.....																															
Warner Springs.....	Coast.....																														T.	
Wasco.....	San Joaquin.....																														0.00	
Watsonville.....	Coast.....																														0.47	
Weaverville.....	do.....																															
Weitchpec.....	Klamath.....							.79	.11	.06	.66	1.60	.25	.40	.14			.58	2.19	5.30	5.57	.15									18.16	
West Branch.....	Sacramento.....																														1.97	
Westley.....	San Joaquin.....																														0.14	
West Point.....	do.....																														0.02	
West Saticoy.....	Coast.....																														0.00	
Wheatland.....	Sacramento.....																														0.72	
Willows.....	do.....																														0.26	
Yosemite.....	San Joaquin.....																														0.18	

* Precipitation included in that of the next measurement.

† Separate dates of falls not recorded.

|| Precipitation for the 24 hours ending on the morning when it is measured.

T. Precipitation is less than 0.01 inch rain or melted snow.

